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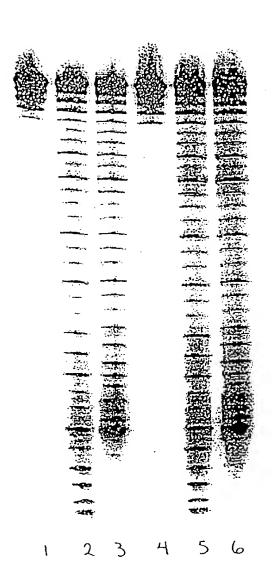
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CPGVV DNAVV Dyev OH 
$$\frac{1}{H}$$
 CPGVV DNAVV DyevvO- $\frac{0}{H}$ -Ov Z

$$III \qquad III \qquad \frac{0}{0}$$

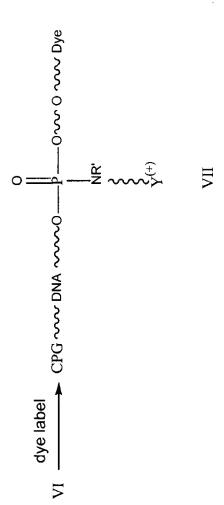
$$\frac{0}{0}$$
CPGVV DNAVV OH  $\frac{0}{H}$ 

$$III \qquad activator \qquad VPGVV DNAVVO- $\frac{1}{H}$ -Ov Z

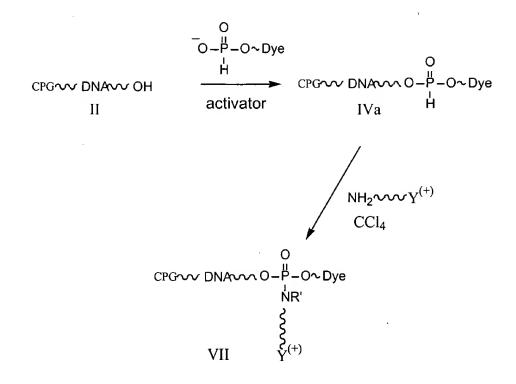
$$II \qquad IV \qquad H$$$$

III 
$$\frac{\text{NHR'} \sim \gamma^{(+)}}{\text{CCl}_4/\text{Pyridine}}$$
  $\frac{\text{CPG} \sim \text{DNA} \sim \text{Dye} \sim 0}{\text{V}} = 0 \sim Z$ 
 $\frac{\text{NHR'} \sim \gamma^{(+)}}{\text{V}}$ 
 $\frac{\text{NHR'} \sim \gamma^{(+)}}{\text{CPG}} = 0 \sim Z$ 
 $\frac{\text{CCl}_4/\text{Pyridine}}{\text{CPG}} = 0 \sim Z$ 
 $\frac{\text{CCl}_4/\text{Pyridine}}{\text{VI}} = 0 \sim Z$ 

 $Y^{(+)}$  = organic group capable to introduce positive charge



R', R", R3 = H, alkyl, aryl

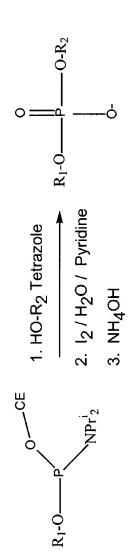


3' 
$$\left[\frac{dN-o-P-o}{dM-COM} \xrightarrow{\text{cleavage}} 3' \left[\frac{dN-o-P-o}{dM-O-M-o}\right] + HO-dN-COM \right]$$

3'-DNA-5' 
$$\sim$$
 Cy<sub>3</sub>  $\sim$  O P O Z — OH NH

V-(Hex)  $Z = C_6H_{12}$ 
V-(dT)  $Z = dT$ 
V-(dC)  $Z = dC$ 
V-(dA)  $Z = dA$ 
V-(dG)  $Z = dG$ 

chiral phosphoramidate phosphorus atom

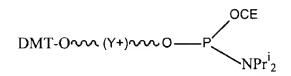


Phosophodiester Linkage

CE = Cyanoethyl

Phosphoramidite

Α.



B.

DMT-O
$$\sim\sim$$
(Y<sup>†</sup>)<sub>n</sub> $\sim$ 0 — P $\sim$ NPr $_2^i$ 

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C. 
$$(0)$$
 (-1) (+1)  
C.  $(0)$  (-1) (PBB)<sub>n</sub> - (PCP)<sub>(n+1)</sub>

D. 
$$(0)$$
 (-1) (+1) (0)  $(3'-DNA - (DP) - (PBB)_n - (PCP)_{(n+1)} - (NP)_m$ 

Neutral Phosphoramidite

Net Charge: 0

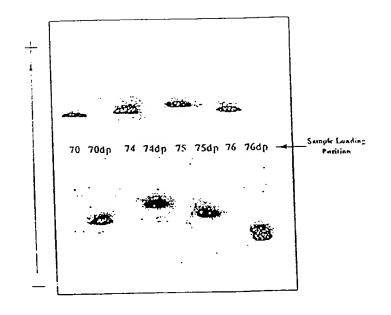
Positively Charged Phosphoramidite

Net Charge: +1

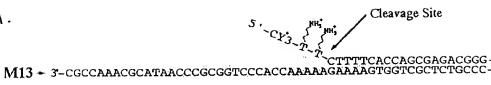
HO 
$$\sim$$
 N  $\sim$  O  $\sim$ 

$$OH \sim Cy3 \sim O. \stackrel{O}{P}.O. N = O. \stackrel{O}{P}.O. N = O. \stackrel{O}{P}.O. N = O. \stackrel{O}{P}.O. (5') DNA$$

OH
$$\sim$$
Cy3 $\sim$ 0. $\stackrel{\circ}{P}$ .O $\stackrel{\circ}{N}$  $\sim$ 0. $\stackrel{\circ}$ 

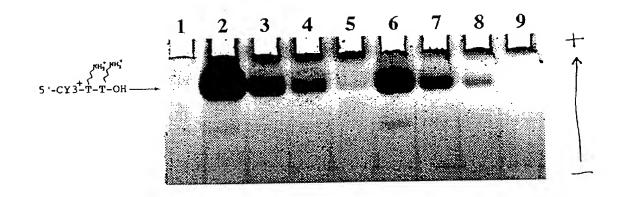


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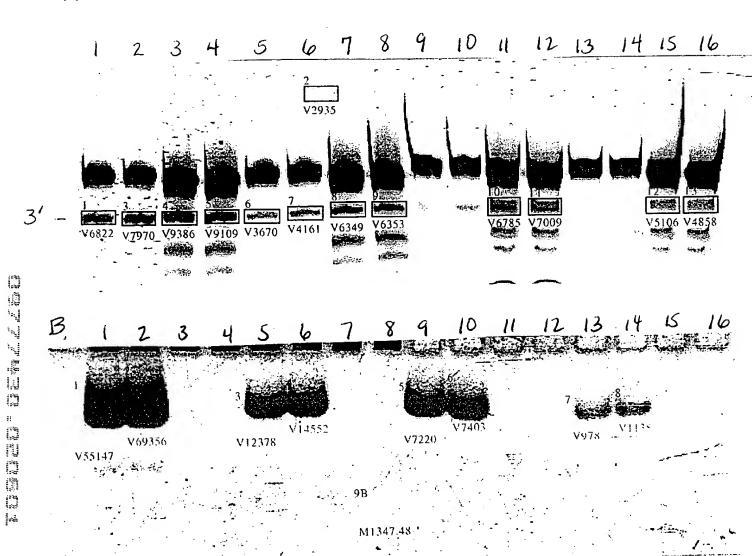


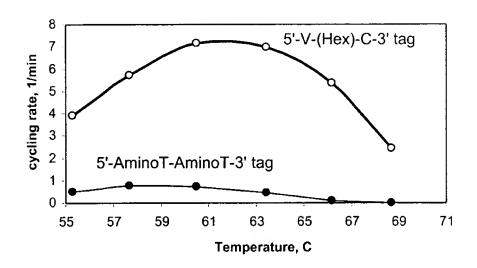
TATTGGGCGCCAGGGTGGTTTŤŤ

B. 50 55 60 65 - + 1 - 1 2 3 4 5



A





A.

CTTCGGAGTTTGGG-NH<sub>2</sub>-3'

5'-GGGTTGTGGAGTGAGTGTTCAAGTA-3'

3'-CCCAACACCUCACUCACAAGUUCAGAAGCCUCAAACCCAAACGAA-5'

B. 804-41

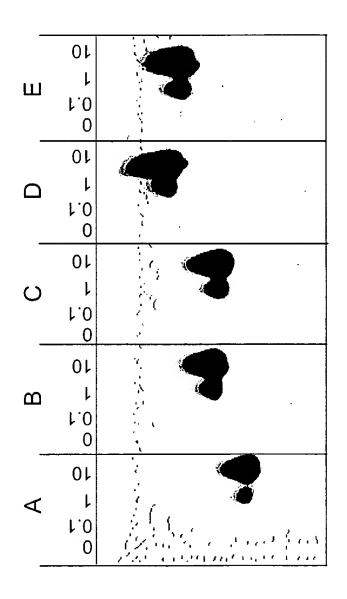
S'OH-dN-O-P-O
NH
CH2
CH2
CH2
CH3
CH3
CH3
V(dN)

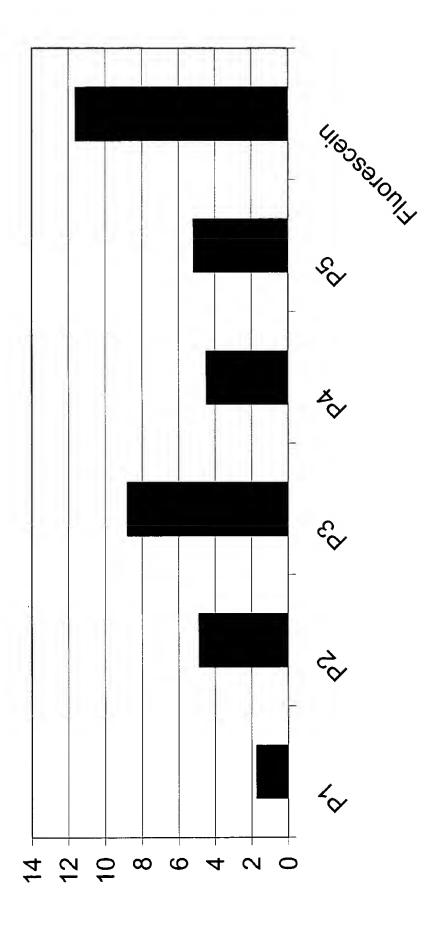
V(HEX)

FIGURE 24A

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	1.0	•
	0	•
O	10	•
	니	~**
	1.0	•
	10	•
മ	01	<b>•</b>
	L	
	1.0	•
	0	•
∢	01	We say
	<b>↓</b>	AMPLE AND ADDRESS OF THE PARTY
	1.0	
	0	

FIGURE 24B





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**FIGURE 26A** 

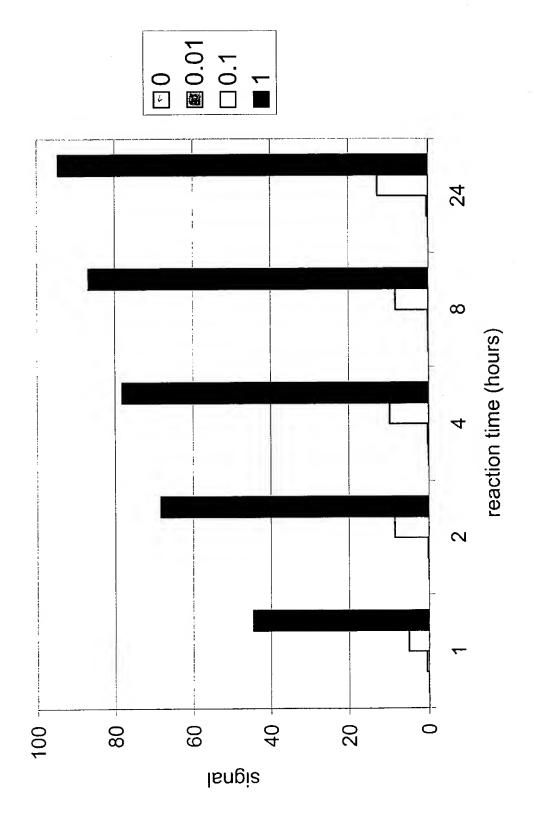


FIGURE 26B

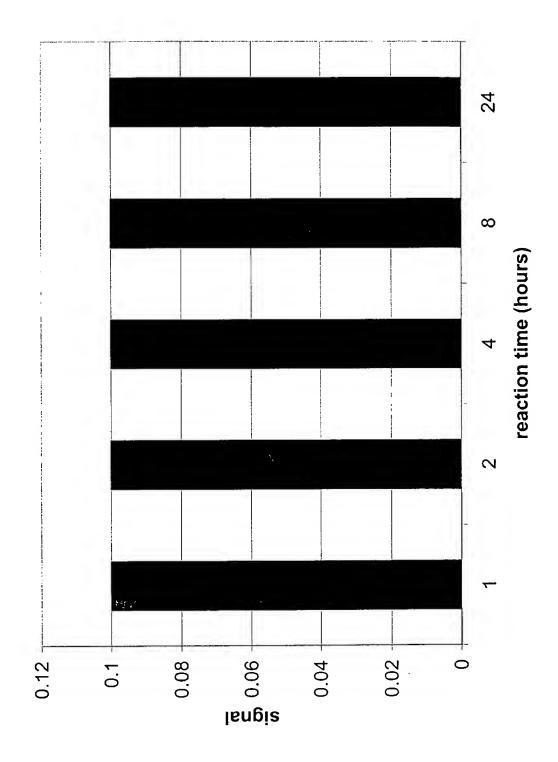
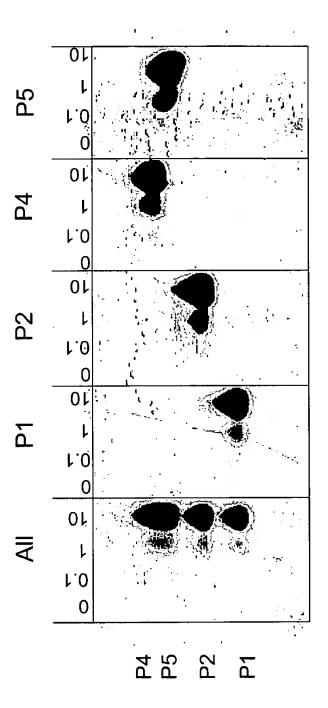


FIGURE 27



### FIGURE 28A

#### Primary reaction

S, CCGTCACGCCTTCGGAGTTTGGG-NH2-3'

5'-GGGTTGTGGAGTGAGTGTTCAAGTA-3'

5'-V(dC)+

3'-CCCAACACCUCACUCACAAGUUCAGAAGCCUCAAACCCAAACGAA-5'

#### **Human MCP-1 mRNA**

5'-CCGTCACGCCTCCTTCGGAGTTTGGG-NH2-3'

3'-NH2-GTGCGGAGGAAGCCTCAAACCCAA-5'

Secondary reaction

CATTCTCAGTGCG-3'

5'-CCGTCACGCCTCC
3'-NH<sub>2</sub>-UGGCAGTGCGGAGGAGTAAGAGT<u>G</u>ACGCG-5'

### FIGURE 28B

Primary reaction

5. AACGAGGCCACCTTTACATTTTCTATCGT-NH2-3'

5'-CCTTCCTTATCCTGGATCTTGGCA-3'

3'-GGAAGGAATAGGACCTAGAACCGGAAATGTAAAAGATAGCATAGGC-5'

#### **Human Ubiquitin mRNA**

5'-AACGAGGCGCACCTTTACATTTTCTATCGT-NH $_2$ -3'

3'-NH2-CGCGTGGAAATGTAAAAGATAGCA-5'

Secondary reaction

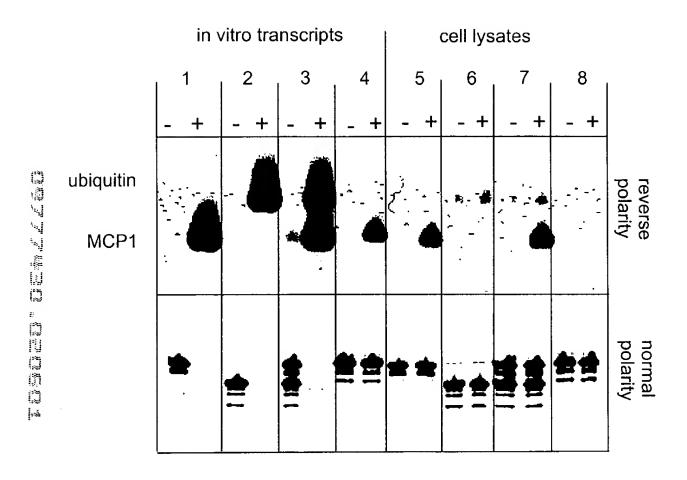
5'AACGAGGCGCACC  $3'-NH_2-AAUUGCTCCGCGTGGTGAACGAAGAAGAAGCC-5'$ 

V(dQ)+

FIGURE 29

,	1000	
	100	
	01	*
	L	
	0	
	1000	
	100	•
C	01	
	)   	*
	0	
	1000	
	100	
Ω	01	
	0	*
	0	
	1000	<b>₩</b>
	100	
⋖	10	
	0	
	0	
		<u> </u>
		iquitin ACP1
		bid M
		)

## FIGURE 30A



## FIGURE 30B

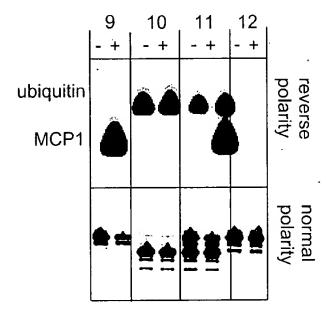


FIGURE 31

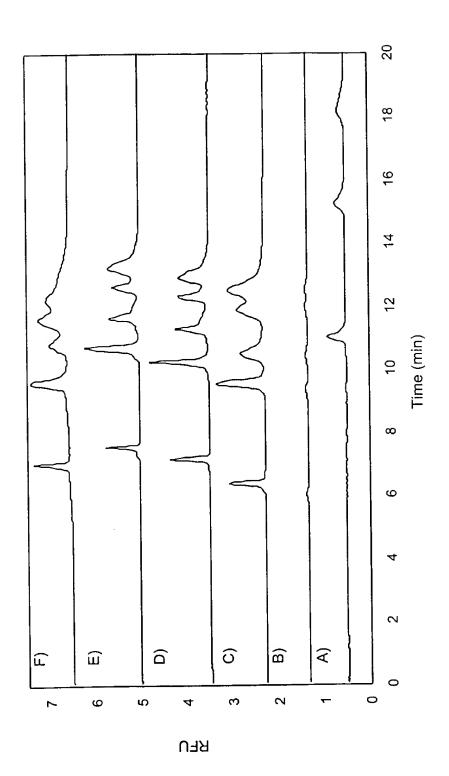
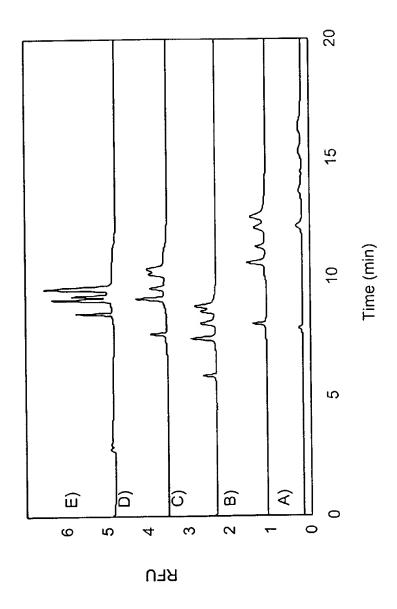
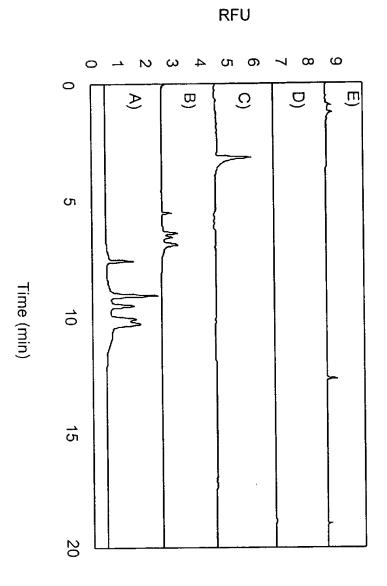


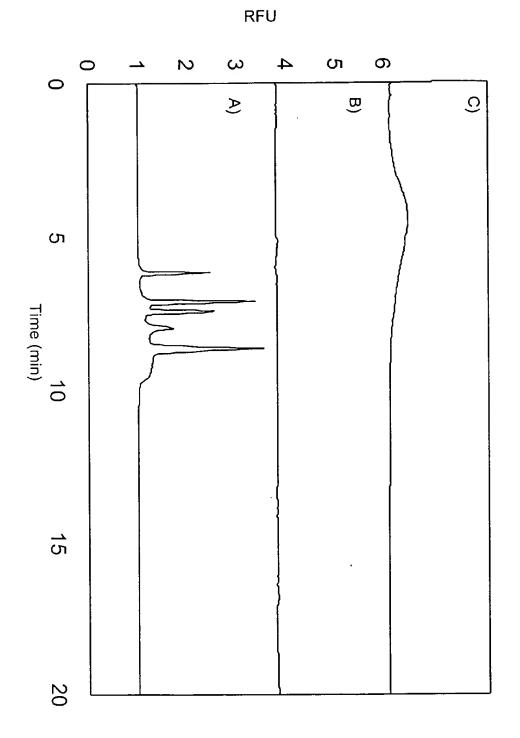
FIGURE 32





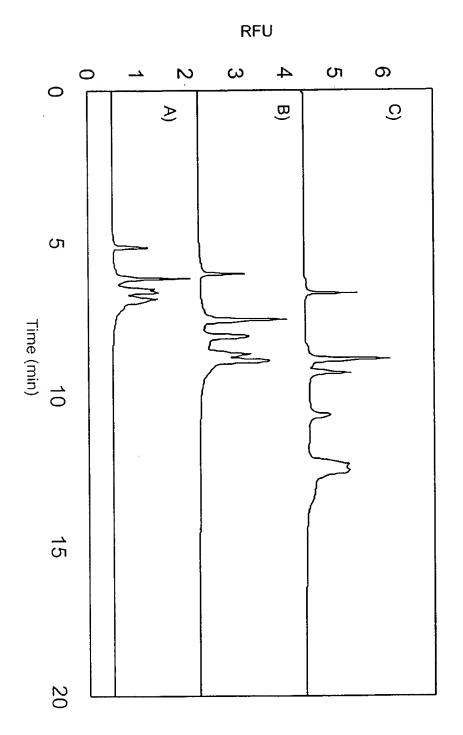
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FIGURE 34



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RFU

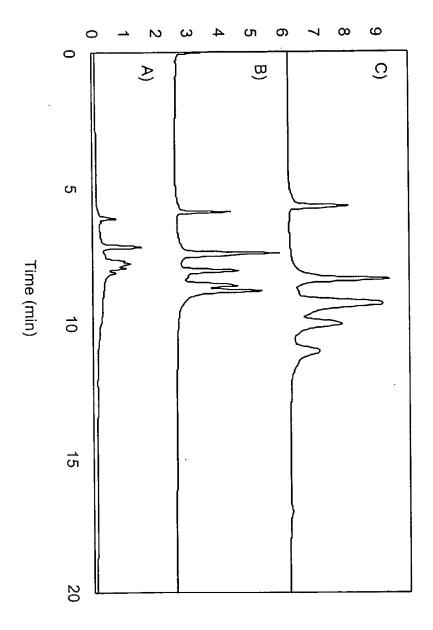
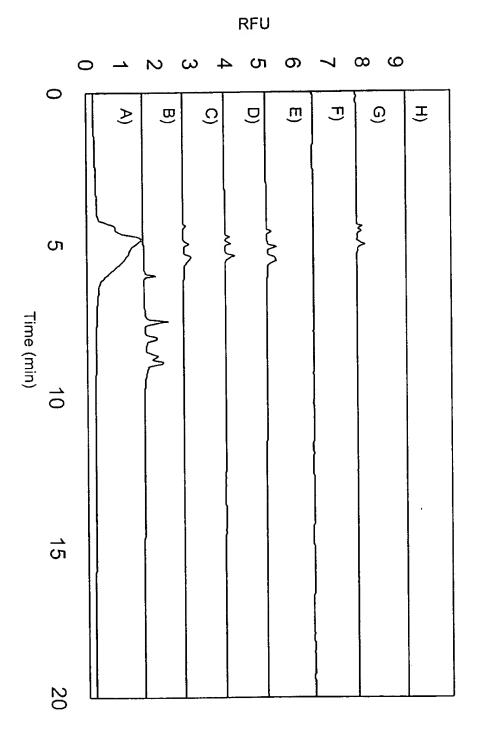
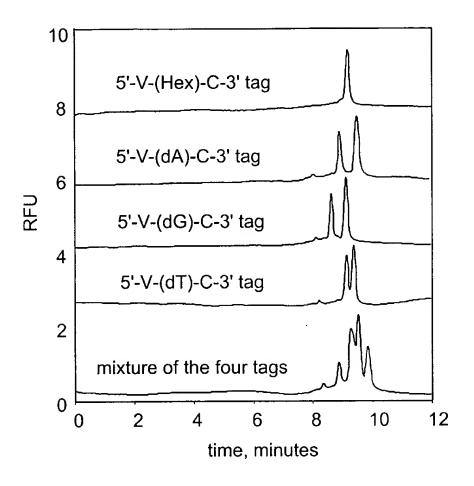


FIGURE 36





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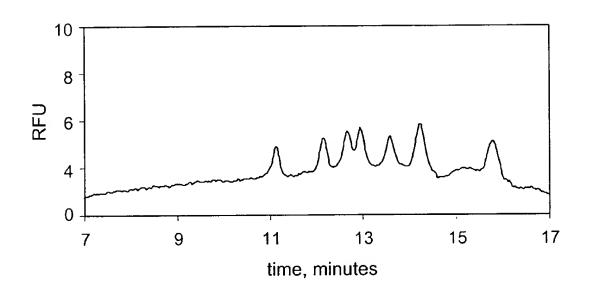
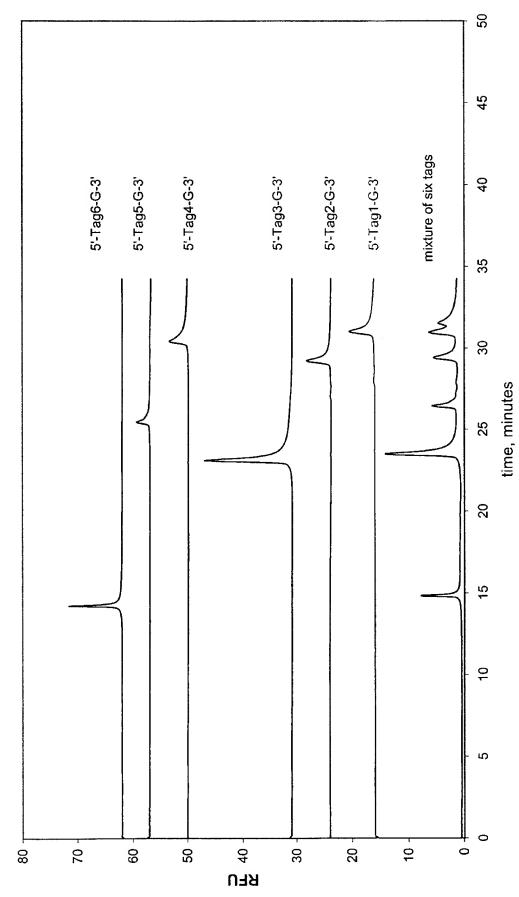


FIGURE 40



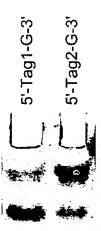
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Α.

5'-Tag1-G-3' 5'-Tag2-G-3'



В.



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